TECHNOLOGY DEPT.

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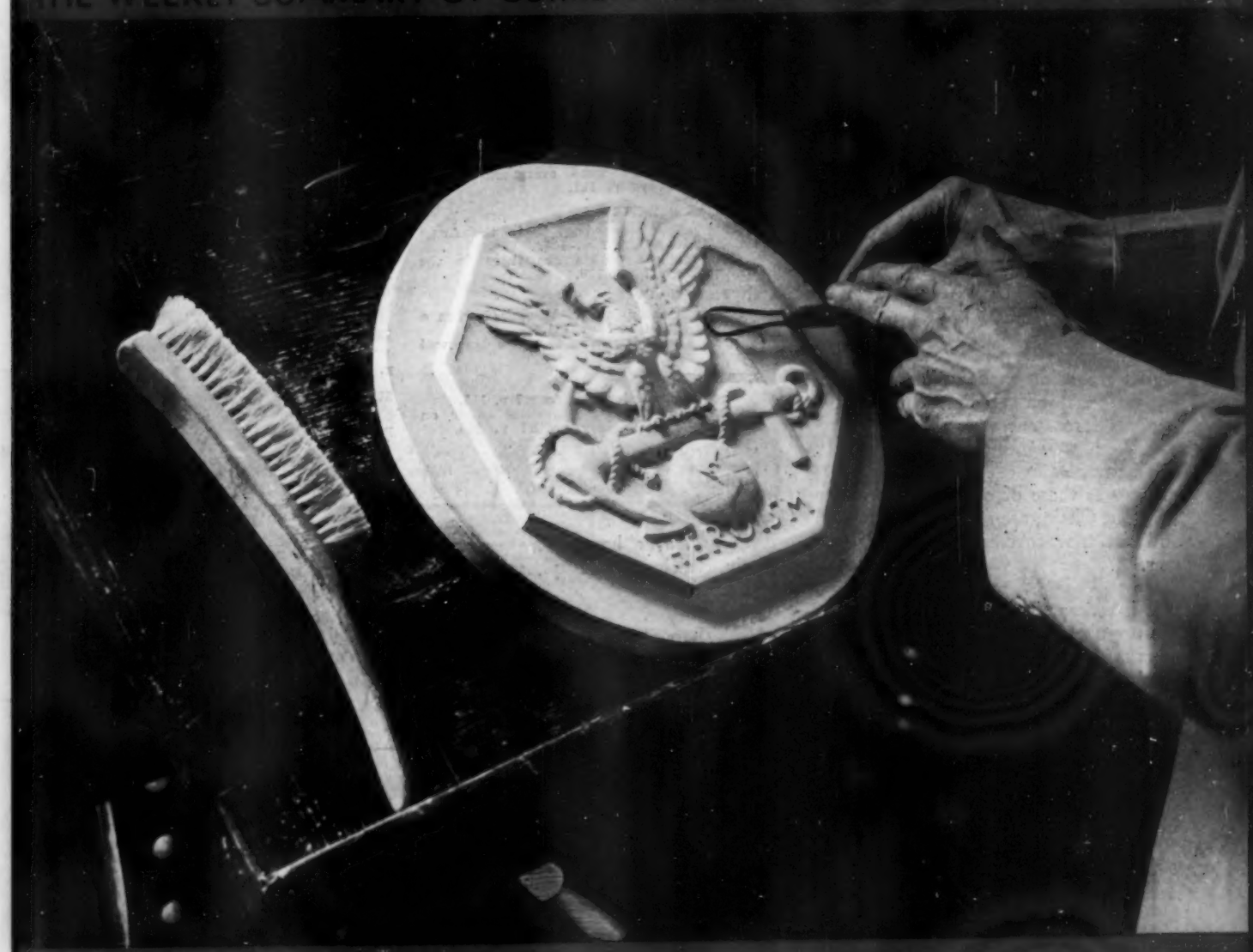
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • AUGUST 21, 1943



For the Brave

See Page 117

A SCIENCE SERVICE PUBLICATION

Do You Know?

A solution which is *saturated* with one substance is still capable of dissolving others.

U. S. air transports carried 70 tons of *tungsten* from China to India in one eight-week period.

Within two minutes a *parachute squad* can jump, land, slip out of their chutes and commence firing.

The irritation from *nettles* is due to the formic acid released when the spines enter the skin and break off.

A low-cost miniature "lighthouse" that broadcasts ultraviolet *health rays* to keep war workers well has been developed.

Helium gas added to certain anesthetics renders them noninflammable, and decreases the fire and explosion hazard in operating rooms.

Each week 500 *transatlantic* airplane flights are being made to deliver combat weapons and supplies to the United Nations forces overseas.

The mountains of *Kiska,* although not so lofty as those of other islands in the Aleutian Chain, are over 4,000 feet high and are snow-covered until early summer.

It is estimated that 50 fighting planes can use up 300,000 rounds of small-arms *ammunition* in one minute, which is as much as 10,000 men in Napoleon's army would have used in a day's battle.

Question Box

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Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

Alfalfa leaves have twice as much protein, calcium and phosphorus as the stems.

More than one-fifth of all the patents issued since the inauguration of the U. S. patent system are concerned with the *automobile.*

Army planes can now carry their own *demountable hangars* to be set up in front-line fighting areas.

New Jersey furnishes 10% of all the fresh fruits and *vegetables* sold in New York City and 20% of those sold in Philadelphia.

SCIENCE NEWS LETTER

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MEDICINE

Stomach Ulcer Cause

Experiment with wetting agents that reduce surface tension of watery solutions shows that when digestive juices penetrate stomach lining, self-digestion occurs.

➤ ULCERS in the upper part of the digestive tract are indicated as a consequence of the stomach's "digesting itself"—a classic and much-debated paradox of physiology—by experiments of three University of Kentucky researchers, Dr. R. L. Driver, Dr. G. S. Dozier and Dr. H. C. Denham (*Science,* Aug. 13). So long as normal health prevails, the acidified digestive juices of the stomach cannot penetrate the lining, but if something happens to make it more permeable, the damaging self-digestion begins, causing the acutely distressing internal "raw" spots.

In their experiments, the three physiologists introduced several well-known wetting agents, or substances that reduce surface tension of watery solutions, into the upper intestines of laboratory animals, together with an acidified solution of pepsin. Ulcers developed in a very high percentage of cases. In the control experiments, where pepsin and hydrochloric acid were introduced separately and without the addition of wetting agents, there was no ulceration.

Four wetting agents were used: calgon, pinacol, hexylresorcinol and methyl salicylate. They all make the mucous lining of the digestive tract more permeable, though each acts in a different fashion to bring this about.

The three Kentucky scientists call particular attention to the action of calgon, which is a water-softener; that is, it takes calcium ions out of circulation.

"Calcium," they state, "combines with lipids and proteins to produce a hardening and protective effect on the mucosa. It is not inconceivable that the beneficial effects of milk in the treatment of ulcers may be attributed in part to its calcium content, and it would seem that the fortification of milk with a calcium salt is indicated."

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NEW PLANT—A big Douglas C-54 cargo transport is shown being finished just inside the door of the new all-timber assembly plant just constructed at Chicago by the Austin Company. By use of laminated timber construction and in other ways, it is estimated that more than 30,000 tons of steel and important metals were saved in putting up this plant. Notice the great beams that look like steel girders.

MEDICINE

Surgeon Uses Special Tub In Treating Severe Burns

➤ A NEW surgical tub, expected to reduce greatly the danger of infection and contamination in the treatment of burns and wounds, has been developed by Dr. Neal Owens, professor of clinical surgery (plastic surgery) in the Tulane school of medicine. The tub, which was built in Birmingham, Ala., was demonstrated by Dr. Owens to the staff of the South Highlands Infirmary, there.

"Designed to offer all necessary requirements for the proper treatment of burns and infected wounds, the tub avoids the usual contamination encountered with our present equipment," Dr. Owens pointed out.

The tub is shaped to accommodate a person lying on his back with his arms spread perpendicular to his body and his legs slightly apart. It has small metal supports pointing upward from its rim. The patient does not lie in the tub, but is suspended on sterile canvas straps in a manner which permits thorough cleansing of the entire body and subsequent application of a dressing without the usual contamination.

Dr. Owens said he found many years ago in the treatment of burns that the normal facilities for the care of such patients were inadequate. About a year ago he set about to design equipment which would make the patient with extensive burns or wounds more accessible for treatment.

"In treating the patient while suspended above the tub, one can thoroughly examine the wound and evaluate its progress more accurately. Because of the special features of the tub it should be a valuable aid in developing a more suitable type of treatment in cases of established infection," Dr. Owens predicted.

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GENERAL SCIENCE

17-Year-Old Youths Go to College for Army

➤ FIRST group of 17-year-old boys selected to prepare for the Army specialized training program have started study at 11 colleges under War Department auspices. Plans are under way to add 12

additional colleges to the program in September.

More 17-year olds will be selected for scholarships by the next qualifying test to be given early in November. Designated as the Army Specialized Training Reserve Program, the plan will provide a continuous flow of specially qualified young men before they enter active military duty.

Three 12-week terms are scheduled, including studies in sciences, English, history, geography and mathematics. At the end of the term in which the trainee reaches his 18th birthday, he will be placed on active military duty. After completing his basic training he will be screened for continuation in the Army specialized training program.

Science News Letter, August 21, 1943

MAKING NEW NICKEL—The photographs on this and the facing page show how that nickel in your pocket was made at the U. S. Mint in Philadelphia. First an artist makes the design in plaster about seven times the size of the finished coin. A negative cast is made from this original and this is copper plated (left) in an electrolytic bath. From the copper plate, a transfer engraving is made on a three-dimensional pantograph (center). The copper plate is then preserved carefully so that it may later be copied as many times as necessary. The transfer engraving first made by pantograph is about half the size of the original and is called an "intermediate." It must be touched up, smoothed and corrected (right).

RADIO

New Radio Station

Ticks, hums and whistles will constitute only broadcasts from the National Bureau of Standards more powerful station.

➤ A NEW, more powerful radio station has been opened by the National Bureau of Standards. No one will be able to tune in for entertaining programs, however, for its broadcasts are limited to ticks, hums and whistles which set the frequency standards for technical men in many industries.

The service has now been extended so that good reception is possible throughout the United States, the North Atlantic Ocean and, with fair reception, over most of the world. Broadcasts will be continuous night and day on five, ten and fifteen thousand kilocycles.

The radio and audio frequencies serve as standards used by radio engineers of the armed forces, commercial stations, and radio industry. It is by the National Bureau of Standards broadcasts that a station periodically checks to make sure that broadcasts are on the frequency prescribed by law and that the programs will come in where the listener expects them to be.

One of the audio frequencies used, 440 cycles per second, is the standard musical pitch corresponding to A above middle C. It is used by all musical instrument manufacturers, and many piano technicians and musicians. The broadcasts are helping to set up a uniform standard; for there has been some difference of opinion as to what the tone A really is.

Besides these frequencies there is a pulse every second heard as a faint tick when listening to the broadcast. These may be used as accurate time signals and their one-second spacing permits scientists to make accurate physical measurements.

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PSYCHOLOGY

Three Persons Out of Four Don't Know Themselves

➤ DO YOU know yourself?

If you can recognize your own hands when seen in a photograph, your own handwriting, the silhouette of your own profile, you know yourself better than three-fourths of the persons tested by Dr. Werner Wolff, chairman of the department of psychology at Bard College, Columbia University, in an 18-year study of personality.

If you can recognize your own voice, you are one person in ten.

This failure of individuals to recognize themselves, Dr. Wolff, in an interview, attributed to an unconscious unwillingness to remember or realize what he is like.

"Man's own image," he said, "is for him taboo. He forgets it. If we show it to him he reacts with emotion."

Yet, surprisingly enough, although men seldom have a chance to observe

PURPLE HEART—This is the plaster cast from which are made the purple heart medals being awarded to our military heroes who are wounded in battle. Up to the point of making the dies, the process of making the medals is practically the same as that shown photographically on this and the facing page for the making of the nickel. Like the nickel, the medal is made at the U. S. Mint in Philadelphia. The cast for a new medal, awarded for heroism in non-combat areas, is shown on the front cover of this week's SCIENCE NEWS LETTER. All these photographs are by Fremont Davis, Science Service staff photographer.

their own gait, they are able to recognize their walk with 100% accuracy.

It occurred to Dr. Wolff that, by asking those persons who failed to recognize their own handwriting and other forms of expression to judge the character revealed there, it might be possible to get at a man's very private opinion of himself.

The interpretation made in this way of a man's own unrecognized expressions agree very well, Dr. Wolff found, with those by other people about him. But he is much more extreme in his judgments.

"If the majority say he is intelligent," Dr. Wolff explained, "he will describe himself as a genius. If the majority say he is unstable, he will describe himself as a neurotic character."

This study of personality is an attempt, Dr. Wolff explains, to develop a way of exploring the depth of personality, or the unconscious, by a method other than psychoanalysis. The objection to psychoanalysis, he says, is that it does not permit experimental proof—a drawback confessed by Prof. Freud himself.

An amusing personal incident suggested to Dr. Wolff his study of man's failure to recognize himself. It is described in his new book, *The Expression of Personality,* just published by Harper, in which he gives details of his long research.

"I went to a tailor to buy a suit," Dr. Wolff writes. "I opened the door of a dressing room but withdrew because a man was in the room. When I told this to the tailor he was astonished, because no one else was there. He went to the dressing room and it was empty, but in the background was a big mirror. The man in the dressing room had been myself, reflected by the mirror."

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MINTING—The intermediate (see facing page) is placed on the pantograph to make another transfer engraving in steel the same size as the final nickel. After hardening by heat treatment, the steel engraving is put in a large hydraulic press (center) and many negative dies are stamped from it (left). Separate dies are made for the "head" and "tail" of the coin. These are placed in the coining machine (right). Blank pieces of metal (which is not nickel any more) are fed into the machine and come out good five-cent pieces.

GENERAL SCIENCE

Half Million Scientists

This estimate by the director of the National Roster of Scientific and Specialized Personnel does not include medical and social sciences.

➤ THERE ARE between 400,000 and 500,000 trained or qualified scientific men and women in the country, excluding the medical and social sciences, and the services of nearly all of them in some way contribute to or support the war effort.

This is the estimate of Dr. Leonard Carmichael, director of the National Roster of Scientific and Specialized Personnel and president of Tufts College, in a statement in *Science* (Aug. 13).

There is reason to believe, Dr. Carmichael states, that over three-fourths of the half-million or less scientists are engaged directly or indirectly in war work. This includes those who are in the Army and Navy and who use their scientific training not necessarily in the scientific specialty for which they prepared.

"Our colleges and their laboratories, our industries and their laboratories, and our government and its laboratories," Dr. Carmichael says, "have become an integrated partnership in the prosecution of a war in which the full might of our scientific and technological capacity is brought to bear upon the enemy.

"Thus, when an individual scientist, without complaint and without heroics of any sort, willingly relinquishes a higher paying and more conveniently located job in order to assume a particular wartime task, his decision to transfer more often than not is based on the higher need for his services in the new undertaking rather than because of any lack of contribution to the war effort in the position vacated. To the individual scientist, the question today is not 'where can he serve' but 'where can he serve best.' Cold figures can not tell his story, but the enemy has already been made to understand it."

Making an estimate of the number of scientists in war work is difficult, Dr. Carmichael explains. He analyses the physicists as an example. There are somewhat more than 7,000 men and women in America who have a master's degree or the equivalent in physics. There are 4,000 more with bachelor's degree who have been treated by the National Roster as professional physicists. This might justify the statement that there are 11,000 physicists in America. On the other hand the number of them who are capable of doing advanced independent research is 2,000 or at most 3,000.

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ENGINEERING

Pre-Stressing Lengthens Life of Machine Parts

➤ MATERIAL INCREASES in the life span or fatigue strength of machine parts, as in airplane or automobile engines, can be obtained by pre-stressing the surfaces of these parts. This suggestion was offered by J. O. Almen of the General Motors Research Laboratories in a report prepared for the Society of Automotive Engineers.

There has been no marked advance recently in super-strength alloys, Mr. Almen pointed out, or any other engineering improvements in the life of dynamically loaded parts. The idea of pre-stressing is not a new one either, for that matter. Our village blacksmith knew and used this technique in making wagon and buggy springs, axles and other heavily loaded parts. After the parts were forged into shape they were severely hammered to improve their strength.

Since fatigue failures result from tension stresses, never from compressive stresses, and since any surface, no matter how smoothly finished, is a stress raiser, he suggests pre-stressing a thin layer of the specimen through compression by shot blasting, peening, hammering, tumbling or by pressure operations by balls or rollers. Tests have shown an increase in fatigue strength whether applied to highly finished or roughed surface specimens. Excessive compression can undo all the value of surface compression. Therefore precaution must be taken to see that there is an equalization between the internal tension stress and the compressed surface.

Corrosion and surface damage causes fatigue stress. Highly finished surfaces may give one a false sense of security, for in the process of finishing, generated heat promotes serious surface tension stress. Other undue surface stresses can be caused by machining, metal cutting or metal punching. In bolts, the weak points are in the thread and in plating the thread with a soft metal to avoid corrosion. Rolling the bolts will increase their fatigue durability. He thus points out that there is a definite place in future design for application of fatigue studies. Emphasis ought to be placed on fatigue surfaces and mechanical failures instead of always examining the fault from a metallurgical standpoint. Metallurgical examination is only part of the answer to the materials' failure. Fatigue of materials should be studied by all three departments — metallurgical, engineering and production.

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ENGINEERING

Air-Conditioning Unit for Small Houses Patented

➤ A GREATLY simplified, light-weight air-conditioning system for small homes, which can be installed in existing buildings, is an outstanding item among the 558 inventions on which patents have recently been granted by the U. S. Patent Office. It is the design of R. E. Gould of Oakwood, Ohio, who has assigned rights in his patent, No. 2,320,035, to the General Motors Corporation.

Most air-cooling apparatus for dwellings combines motor-compressor, cooling coil and circulating fan in a single unit, which has to be installed in the attic. But such a unit is usually too heavy for the attic of a small house. Mr. Gould obviates this by the simple device of placing his motor-compressor in the basement, leaving only a simplified, light-weight cooling coil and blower to be installed in the attic. The refrigerating unit in the basement cools water from the city mains, which is then carried to the cooling coil in the attic. At times, the inventor points out, the city water will be sufficiently cool so that it will not be necessary to operate the mechanical refrigerating unit at all.

The complicated system of ducts used in conventional air-conditioning systems is also dispensed with in this invention. The cooled air from the attic is simply permitted to flow down stairways and through halls, its distribution being assisted by leaving windows slightly open.

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ENGINEERING

Dynamite Bonfire

The way to dispose of damaged or useless dynamite is to burn it—but cautiously! Explosives engineers tell what precautions to take.

➤ BURN DYNAMITE that has been wet, or has been damaged in storage or handling, or is left over after a job and cannot well be carried to the site of a new one, is the recommendation of a group of explosives engineers, presented to the Institute of Makers of Explosives (*Explosives Engineer,* July-Aug.). This advice is less perilous than it may sound, for dynamite and other high explosives will as a rule simply burn rather fiercely if ignited with a flame, but will not explode unless the proper detonating cap is used.

However, the engineers caution, it isn't safe to assume that your dynamite will burn up thus harmlessly. Always set your dynamite bonfire as if you expected it to blow up, and keep well away from it until it has burned itself out.

Dynamite should never be burned in cases or deep piles, the recommendations state. The cases should be opened with wooden mallets and wedges, using special care if there are any signs of leakiness. The cartridges should be removed, slit, and spread over the ground, preferably with a mat of loose paper or excelsior underneath them. In no case should the layer of dynamite be more than two or three inches thick. Before lighting the fire, it is important to search through the loose explosive carefully, to make sure that there are no stray detonators lost in it.

Some dynamites are difficult to ignite, hence it is necessary to have fuel beneath the cartridges. If the dynamite is wet and does not burn readily, it may be necessary to pour a little kerosene over it. The fire should be lighted in such a way that it will be a little while in reaching the dynamite—long enough for the man who lights it to get away to a safe shelter.

A second dynamite bonfire should not be started on the ashes of the first. Heat remaining in the soil makes this procedure dangerous. As soon as all the dynamite has been burned the soil should be plowed. The residue from burned dynamite contains mineral salts which cattle may eat—with serious results to themselves.

Leaky dynamite sometimes leaves wet spots of nitroglycerin on magazine floors. The engineers recommend that such floors be scrubbed with a mixture of water, denatured alcohol, acetone and sodium sulfide. This decomposes the nitroglycerine and renders it harmless.

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STATISTICS

May Is Month of Disaster Red Cross Study Reveals

➤ MAY is the month of disaster. It tops all other periods for havoc of storm, fire and flood in a twenty-year study just compiled by the American Red Cross.

Early spring months, March through June, captured the dubious honor of bringing most disaster to the nation on the average. Tornadoes stood far above other causes, with 617 recorded during the period 1920 to 1940. Thirty-seven states were hit but Texas bore the brunt of the destructive whirlwinds with a total of 79.

Fires of all types ranked second as a source of disaster, with floods following close behind.

For relief work during the two decades Red Cross announced that it had spent $96,616,961.

During the year ending June 30, 1942, a total of 171 disasters are recorded, with tornadoes again topping the list.

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PHYSICS

Electronic "Chemist" Aids Synthetic Rubber Making

➤ IMPROVED synthetic rubber production will result from use of an electronic "chemist" to analyze the complicated gases formed in making butadiene. Dr. John A. Hipple, physicist at the Westinghouse Research Laboratories, in cooperation with technical men from the industries involved, adapted the instrument, called a mass spectrometer, for its new war job.

"In 15 minutes," Dr. Hipple explained, "this spectrometer will dissect a complicated gas molecule a twenty-five-millionth of an inch long, and can be arranged to produce automatically an autograph that tells the chemist the composition of the gas.

"At present certain analyses require from 15 hours to three days of pains-taking laboratory work by five to 10 skilled chemists—others cannot be done at all even by other processes. Results attained by these tedious methods are much less accurate than the molecular 'portrait' that comes out of the spectrometer."

As butadiene molecules are built up in the chemical plant, their composition must be checked at intervals to make sure the correct structure is being obtained. An error in molecular design would result in poor quality synthetic rubber.

Present methods are sometimes so slow that the batch of butadiene has gone through the various steps of processing before the check analysis is completed, Dr. Hipple pointed out. Thus, under the old method, a batch of butadiene may have to be reprocessed, causing lost production time.

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MOLECULE SORTING — Production of synthetic rubber is speeded with this new instrument, a speedy and practical mass spectrometer. Dr. John A. Hipple, Westinghouse Research Laboratories physicist, who developed the instrument, is holding the key part of it—a curved glass tube fixed between the two poles of an electromagnet. The magnet pulls on electrified molecules going down the tube so that only those having a certain mass can go around the curve to reach a target where they are counted. This gives a quick check on the composition of the mixture.

PUBLIC HEALTH

Polio Epidemic Reached In Texas and California

➤ NEW CASES of infantile paralysis mounted to 437 for the week ending Aug. 7, compared to 361 for the previous week, with more than a third of the victims located in California and Texas, where the outbreak has reached epidemic proportions, Public Health Service reports show.

Hope that the epidemic is abating in Texas was raised by a slump from 104 new cases to the latest figure of 62. California tops the list with 111 new cases, many of them located in southern California or in the area across the bay from San Francisco. Oklahoma reported 52 cases and Kansas 43, both substantial increases over the previous week.

A few increases of infantile paralysis in Eastern states were reported but health officials doubt that an outbreak of epidemic proportions will be reached at this late date. The peak number of cases is usually reached in the United States around the second week of September, then tapers off.

There have been 2,753 infantile paralysis cases reported this year, as of latest tabulation Aug. 7, compared to 1,148 cases for the same period last year.

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NUTRITION

Butter Found No Better Than Other Fats for Rats

➤ BUTTER OFFERS no advantage over other common food fats in promoting the growth of young laboratory rats, Dr. Harry J. Deuel, Jr., Eli Movitt and Lois F. Hallman of the University of Southern California Medical School report. (*Science*, Aug. 6)

They fed groups of young rats on measured rations, identical in every respect except that several different fats were used on different animal groups. These included butter, margarine, and corn, cottonseed, olive, peanut and soybean oils. Supplementary vitamins were included in all diets.

The young rats, weighed at frequent intervals, all grew at substantially equal rates, no matter what fat was included in their diet. The butter-fed group enjoyed no apparent advantage over the others.

Prof. Deuel explains the seeming discrepancy between the results of these experiments and the reports of other workers that indicate a difference in favor of butter by pointing out that in the other research the animals were not on a measured diet but were permitted to eat as much as they wanted of whatever they liked. And there is no question that rats like the taste of butter and will eat it in large quantities whenever they get the chance. So the faster-growing butter-fed rats, in Prof. Deuel's opinion, grew faster simply because they ate more, not because what they ate was better in itself.

To check rats' preference for butter flavor, a group of 12 animals were offered, as part of their diet, both unflavored peanut oil and peanut oil with commercial butter flavor added. Eight of the rats invariably chose the flavored oil, while the remaining four ate approximately equal quantities of both kinds. None of the animals showed a preference for the unflavored oil.

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DENTISTRY

Tall, Thin Teen-Age Youths Have Highest Caries Rate

➤ TALL, thin teen-age youth suffers the highest rate of tooth decay of all groups of persons in America. This fact has been revealed by a two-year research study of more than 1,000 children just reported to the American Dental Association by Dr. Maury Massler, director of the Child Research Clinic of the University of Illinois College of Dentistry.

He discovered that 92% of all rampant caries, the most extreme form of tooth decay, occurred in the tall, thin boys and girls undergoing their most rapid spurt of growth. And the rate of growth and the rate of caries was found to be in direct proportion.

"Of all teeth lost because of caries between the ages of 10 and 35," Dr. Massler declares, "87% were lost because of caries occurring during the teen-age."

Pointing out the need for better dental care to reduce the number of rejections for this cause by the armed forces, Dr. Massler reports that "The young adult selectees first brought up for service in the Army and Navy showed strikingly the ravages of teen-age caries neglect. If these boys had had high school dentistry we would not have had 20% of our rejections on the basis of dental troubles."

Dr. Massler conducted his research in collaboration with the Council of the Child Research Clinic. The youths studied represented unselected groups entering the University of Illinois dental clinic and hospital and unselected groups in the pediatric ward.

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IN SCIEN

CHEMISTRY

Post-War Chemical Projects Should Be Planned Now

➤ PRACTICAL and immediate exploration of new chemical projects to fight the menace of post-war unemployment of millions of workers is advocated by a publication of the American Chemical Society.

Release from war production of limited amounts of critical materials and sufficient numbers of trained workers is urged. Chemical projects need from five to ten years from the inception of an idea until a commercial-size plant is operating, it is explained.

Planning in industry is normally a continuous process, but long-term planning has been slowed down during the past year or two because war production has taken all efforts.

The American Chemical Society statement declares that all chemical companies have half-developed projects that are now at a point where semi-large-scale or pilot-plant operation is necessary for further progress, but that shortages of critical materials stopped this work months ago.

Pilot plants can be built by chemical plants under WPB plan P-43 recently issued and this is considered by the chemists to be the first step toward getting their industries ready for a vigorous post-war development.

Science News Letter, August 21, 1943

PHYSICS

Low Expansion Glass Made With Titanium Oxide

➤ GLASS that for all practical purposes does not expand and contract with changes in temperature is the subject of patent 2,326,059 obtained by Dr. Martin E. Nordberg of the Corning Glass Works, Corning, N. Y. Such a glass, very desirable for certain technical uses, has hitherto been made of pure fused silica; but Dr. Nordberg has found that the addition of between 5% and 11% titanium oxide to the silica produces a glass with an even lower coefficient of expansion.

Rights in the patent are assigned to Dr. Nordberg's employing firm.

Science News Letter, August 21, 1943

E FIELDS

INVENTION

Drums Easier on Eardrums Covered in Patent

➤ IN APPLYING for patent 2,326,305, Thomas O. Morarre of Washington, D. C., gets off a masterpiece of understatement. He says that practicing on a drum "is usually objectionable to others in the vicinity." Yet to the ambitious young drummer the dull-toned practice drums commonly offered must be about as encouraging as hammering on a keg of putty would be to a young woodpecker.

Mr. Morarre has produced a practice drum consisting of a head stretched over a shallow depression in a solid block, with an adjusting screw to tune it. This, he states, gives an adequately crisp tone, but lacks the volume that makes life a burden to the neighbors. The family, presumably, will still have to put up with it.

Science News Letter, August 21, 1943

PHYSICS

Prospecting Proves Value Of "Electrical Detective"

➤ PROSPECTING for radium ore with an "electrical detective" has proved practicable and the instrument may be adapted for sorting and grading radioactive material after it is mined.

A portable adaptation of the Geiger-Muller counter, an instrument ordinarily used in the laboratory to detect and count ionizing particles, was designed for prospecting by Dr. G. L. Locher of the Bartol Research Foundation, Swarthmore, Pa.

It was then turned over to G. Carman Ridland, formerly resident geologist for Bear Exploration and Radium, Ltd. in Canada, who reveals the results of his work in a report to the American Institute of Mining and Metallurgical Engineers.

"The results obtained with the Geiger-Muller counter at Great Bear Lake demonstrate that the instrument can be of value in the search for radioactive ore," Mr. Ridland declares. He believes that the counter is "not only adaptable to the detailed search for radioactive ore bodies in established radioactive territories, but could, and should, be used by prospectors and members of federal geological survey parties in their aerial reconnaissances of large, unexplored regions."

Mr. Ridland surveyed areas at Contact Lake in Canada where pitchblende veins, source of radium and uranium, had been encountered during silver mining. By detecting abnormally high numbers of gamma rays shooting from the rocks, Mr. Ridland found several areas which warranted definite exploration programs.

Each ray entering the counter is translated by the instrument into a click which the operator hears in earphones. Since the instrument is also sensitive to the cosmic rays reaching the earth from outer space, a correction must be made for the background of clicks heard due to the cosmic rays.

Science News Letter, August 21, 1943

ETHNOLOGY—MEDICINE

Evergreen Needles Used For Scurvy 400 Years Ago

➤ VITAMIN C, the scurvy-preventer, was recently found by Russian botanists to be present in ordinary pine needles. This discovery was hailed as significant and very properly so, because although the concentration in pine needles is not great, Russia has simply unlimited quantities of evergreen trees.

However, although the discovery is new from a biochemical angle, from the viewpoint of practical medicine it is not. Without knowing anything about vitamins, American Indians 400 years ago knew how to cure scurvy with a tea made from evergreen needles.

Dr. Maurice Donnelly of the U. S. Soil Conservation Service research laboratory in Riverside, Calif., calls attention (*Science*, Aug. 6) to a passage in Parkman's classic historical work, *Pioneers of France in the New World*, which tells of the troubles of the French explorer Jacques Cartier and his party in Canada, just four centuries ago. Twenty-five of the men were dead of scurvy, and only three or four were still able to get about in anything like full vigor.

Cartier, walking one day near the river, met an Indian, who had been as sick as the rest a short time before, but now appeared to be perfectly healthy. When questioned, the Indian told his white chief of making a drink of the leaves of a certain evergreen. The Frenchman tried it on his men, and in a week they used up all the foliage of a large tree. Recovery of the party began immediately.

Science News Letter, August 21, 1943

INVENTION

New Type Telescope Mount Like Coast-Defense Gun's

➤ THAT A GREAT industrial concern may be interested in "pure" science, of the "useless" variety, no less than in immediate practical applications, is evidenced by the fact that General Electric is assignee of a patent having little apparent connection with electricity: No. 2,326,552, covering a radically new design in mounts for large astronomical telescopes. It is the invention of Harold F. Morse of Southport, Conn.

Most large astronomical telescopes are set up on what is known as an equatorial mount, which enables them to follow the apparent movement of the stars as the earth rotates beneath them. Actually, these equatorial mounts would be better adapted for small telescopes than for large, because the imposition of heavy weights tends to bend them out of line; only slightly, to be sure, but enough to falsify results if difficult compensatory adjustments are not made.

Mr. Morse's system for mounting telescopes has in it some of the elements of the mounts of coast-defense guns. The heavy tube is suspended on trunnions from massive supports that stand on a massive ring, bringing the instrument to bear in any desired direction. Under the tube two training arcs at right angles to each other, control elevation.

One inherent effect of the mechanism is to rotate the telescope tube on its own axis. This is no drawback in visual observation, but would render photography impossible, but for a further adjustment, whereby a compensatory rotation is imparted to the plate carrier.

Science News Letter, August 21, 1943

CHEMISTRY

Russian and Chinese Scientists Are Honored

➤ HONORARY membership in the Society of Chemical Industry will be awarded to Dr. Alexei Bach, Russian biochemist, and Dr. Te-Pang Hou, Chinese industrial chemist, at a dinner meeting on Oct. 22, when Wallace P. Cohoe of New York will be inducted as president of the Society.

Maxim Litvinoff, Russian ambassador to the United States, has been invited to receive the honor in behalf of Dr. Bach. The presentation to Dr. Hou is expected to be made by Dr. Wei Tao-ming, Chinese ambassador.

Science News Letter, August 21, 1943

ASTRONOMY

Other Worlds

No human eye will ever see them, but far beyond the outmost limits of our solar system there are other planets of other suns.

By MARTHA G. MORROW

➤ THERE ARE other "worlds" than ours! Not just the nine children of the Sun, the planets of the Sun among which the Earth is numbered.

There are other planets of other suns, heavenly bodies that astronomers believe worthy of the name "planet." Giant planets they are, satellite to stars a million times more distant from us than the 92,870,000 miles which separate us from our own Sun.

No human eye will ever see them as we view Venus or Jupiter or Mars or Saturn in the night sky. Only through the effect of these distant, dark bodies upon the stars to which they owe allegiance were astronomers able to discover their existence.

There are even some who say: "They are not planets. They are only a special kind of star. The only planets are those in our own solar system." While others object to calling them other "worlds," holding that the word "world" should be reserved for our inhabited earth and not used even for the other planets of our solar system which may or may not be the abode of life.

A few months ago a young man who had come from Denmark only a few years before stood in the speaker's rostrum of the American Philosophical Society in Philadelphia and told his fellow scientists that he had evidence of a third object associated with the double star 61 Cygni. This astronomer is Dr. K. Aa. Strand of Swarthmore College's Sproul Observatory.

Orbits Not Smooth

Studying the double star in Cygnus, the Swan, young Dr. Strand discovered that the orbits, or paths in space along which the pair of stars move, were not exactly smooth. The only explanation for the irregularities in the star paths, reasoned Dr. Strand, must lie in the presence of a third body. It had to be massive enough and close enough to one of the components of 61 Cygni, as the double star is named, to drag the star slightly out of its orbit by gravitational pull, he believed.

The unseen third member making up this star, Dr. Strand's calculations indicated, is an object far smaller than any known star—only one-sixtieth the mass of the sun. This would give the first known extra-solar planet a mass about 16 times that of Jupiter, the largest planet in our system. This dark object is thought to swing around the star which is its sun once every 4.9 years.

A similar companion for a double star in Ophiuchus, the Serpent Bearer, was announced early this year by Dr. Dirk Reuyl of the University of Virginia, and Dr. Erik Holmberg of Lund University, Sweden. From the measurements of photographs made in the quiet of the Leander McCormick Observatory, under the direction of Dr. S. A. Mitchell, they tracked down an invisible partner for 70 Ophiuchi. It completes its course approximately every seventeen years and is believed to be only about one-hundredth the size of the sun. This body then is even smaller than the one discovered in the system of 61 Cygni and boldly called by Dr. Strand a "planet."

Another Planet

More recently still another "planet" has been reported by Dr. Reuyl from McCormick Observatory photographs, a body three-hundredths of the mass of the sun. It is the attendant of an inconspicuous single star known by its catalogue name of Cincinnati 1244.

The search for planets is still in its initial stage. Some astronomers are not yet convinced of the existence of these "planets." Particularly is the existence of a small companion to 70 Ophiuchi being questioned. But just as it is impossible to see these silent partners of a star and thus prove their existence, so it is difficult to disprove such a companion for any system. The study of planets already reported is being continued and checked.

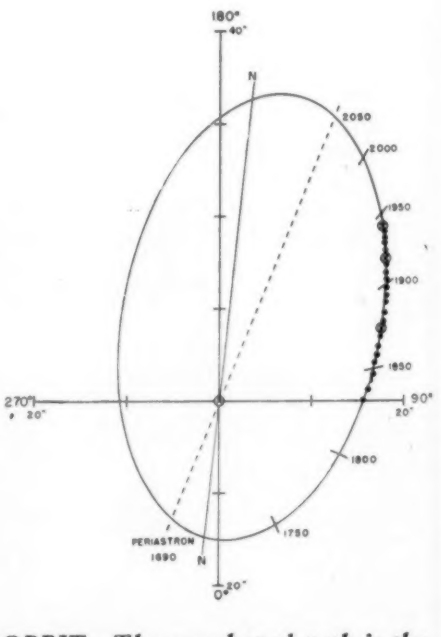
Should these newly discovered objects rightly be called stars or planets? Until recent times and the development of telescopes which could better penetrate the veil of space, such bodies went undetected. Now we know of their existence, what are they like?

The term "planet," usually applied only to bodies of the solar system, may be reinterpreted to include all astronomical bodies, in orbital motion around a more massive luminous primary (not necessarily the sun), which shine by reflected light.

Travel Around Stars

Study of the periodic variations of 61 Cygni and 70 Ophiuchi from their prescribed orbits and that of Cincinnati 1244 from uniform linear motion indicate that the small stellar companions do travel around much larger stars.

Large stellar masses such as a million times that of the earth, Sir Arthur Eddington pointed out, must necessarily be luminous stars. Working on the relation between the mass and luminosity of a star, he explained that an extremely hot interior is necessary to support the enormous internal pressure. Heat, radiating to the surface, keeps the body violently luminous. A mass a hundred thousand times that of our planet will prob-



ORBIT—The egg-shaped path is the computed apparent motion of the fainter member of the double star, as it revolves around its bright sister located in the center at A. Each (X) represents photographic observations. It was noted that this path was not exactly smooth, the star being dragged slightly out of its path, Dr. Strand reasoned, by the pull of a planet.

SCENE OF DISCOVERY—Evidence of a planet outside our solar system was first produced at the Sproul Observatory by Dr. K. Aa. Strand of Swarthmore College. Still unseen, the new planet's presence has been determined from studies of its companion, 61 Cygni, a double star.

ably not be so hot inside, nor shine so brightly. For masses less than ten thousand times that of the earth the escape of heat will be so small, according to Eddington's calculations, that the bodies will appear dark.

Investigating the surface of the planet attached to 61 Cygni, Dr. Henry Norris Russell of the Princeton University Observatory estimates that the surface may be hot enough to appear feebly self-luminous against a black background. But the light which it reflects, the veteran astronomer believes, would be so much greater that it would actually be shining by reflected light.

You may already have begun to wonder if there is life on these newly-discovered planets. A definite answer certainly cannot be given when the possibility of even seeing these bodies is quite hopeless at such great stellar distances, but the chances are that life as we know it does not exist there.

No Evidence Available

With the exception of Mars and Venus, the other planets of our own solar system are either too hot or too cold for life such as ours. The kind of life with which we are familiar requires water and oxygen, but so far no positive evidence has been found of their existence on any of the other planets.

Much speculation has been made as to the type of life, if any did exist, to be found on Mars, and trips to investigate this planet have been proposed. But since we know so little about Mars, which sometimes comes within 35,000,000 miles of the earth, our chances of securing definite information about these extra-solar planets are very slight.

More To Come?

Perhaps the discovery of these planets is only the beginning of the discovery of many planets circling around other stars than ours. Some believe additional planets of our own system remain to be discovered. Fourteen years ago Pluto, the ninth planet of the solar system, had not yet been found.

Locating a planet is usually not accidental, but the results of years of research. Occasionally a planet, by its influence on a neighboring body, invites discovery for years before it is finally found.

The planet Uranus, discovered late in the eighteenth century, refused to follow the orbit computed for it, and by the middle of the nineteenth century it had strayed from its course two minutes of arc, an enormous amount in the eyes of astronomers. Deciding a distant, undiscovered planet must exist, two astronomers independently calculated its probable location.

An Englishman named John Couch Adams finished first, but could awaken little interest in his findings. Upon completing his calculations slightly later, Urbain Joseph Leverrier had the inspiration of writing J. G. Galle at the University of Berlin to direct his telescope to a certain point in Aquarius, the Water Bearer, where he would find a new planet. Within a half hour Galle found the planet less than a degree from the designated place. This new planet, never visible without a telescope, was Neptune.

Pluto The Latest

All of us will remember the excitement attending the discovery of Pluto in 1930. Percival Lowell, certain that yet another planet belonging to Neptune was influencing the orbit of Uranus, spent years searching for it, and after his death, the hunt was continued. Finally, in January, 1930, Clyde Tombaugh, a young man not yet in college, but working at the Lowell Observatory, thrilled at finding on a photograph the tiny image of a new planet in the constellation of Gemini. After discovery of Pluto, earlier plates were examined, and, ironically enough, the new planet was found on a plate taken in 1915 at the Lowell Observatory itself. It was also present on early Mount Wilson, Harvard, and Heidelberg photographs.

All five of the planets with which we are most familiar—Mercury, Venus, Mars, Jupiter and Saturn—were known to the ancients. The early Greeks called them planets, meaning wanderers.

The first discovery of a planet on record—Uranus—was made in 1781 by Sir William Herschel. In the constellation of Gemini, the Twins, he saw an object which could be distinguished from the stars by its disk and reported it as a comet. That it was actually a planet did not become known until almost a year later when its orbit was found to be circular and to lie beyond Saturn.

Due to the recent discovery of the extra-solar planets, new fields of speculation have been opened for the astronomer, the mathematician, the physicist. The search for other planets has just begun.

Science News Letter, August 21, 1943

● RADIO

Saturday, Aug. 28, 1:30 p.m., EWT

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. L. C. Graton, of Harvard University, who recently visited Mexico's new volcano Parícutin, will tell about the results of his trip.

NUTRITION

Three Squares Needed

Food pill won't replace mother's cooking, says biochemist. Only one person in four is on adequate diet, it is estimated.

➤ "IN SPITE of the advances in food technology, one can't look forward to eating a pill for a meal, as a person still needs over two ounces of protein and approximately 2500 calories per day," Dr. Roger Truesdale, consulting research biochemist, reminded his hearers at the Institute of the National Association of Sanitarians.

"We have acquired tastes not in accord with our nutritional requirements, so that according to the U. S. Department of Agriculture only one out of four persons is on a completely adequate diet, and Brig. Gen. H. B. Hershey of the Selective Service reported that one-third of the first million men examined were rejected because of ailments traceable to nutritional deficiencies."

To this Dr. Truesdale added the findings of Dr. Thomas Parran, Surgeon General of the United States Public Health Service that every day one out of twenty people in the United States was too sick to attend school or work, and that the average oldster is sick in bed thirty-five days a year, and the youngster seven.

Dr. Truesdale pointed out that research is being carried on to correlate nutrition with physiological degeneration. Some studies such as those carried on by Dr. Weston A. Price, Fellow of the American Anthropologists, and member of the research commission of the American Dental Association, seem to show that racial stocks living on a simple native diet of whole grain cereals, dairy products, marine products, organs and blood of animals, and fruits and vegetables showed one tooth in every thousand examined having a cavity, as compared with the same type of people living on a modernized diet having approximately 200 to 500 teeth per thousand with cavities.

One item in the faulty average diet is revealed by the fact that in 1793 the per capita consumption of sugar in the United States was 8.8 pounds, while today, 150 years later, it is 118 pounds. Dr. Truesdale summarized the findings of the Gallup poll, cited by a National Research Council Committee, by stating that 45% of adult Americans used no tomatoes, citrus fruits, or juices in their daily dietary pattern; 38% no egg; 34% no milk or cheese; 25% no green leaf or yellow vegetable; 12% no meat, fish or poultry; 8% no potatoes or fruit; and 3% no whole grain or vitamin-enriched cereal or bread.

Science News Letter, August 21, 1943

MEDICINE

Navy Hospital Successful In Use of Red Blood Cells

➤ BLOOD is made to do double-duty at the Philadelphia Naval Hospital, where 116 infusions of red blood cells have been used in the treatment of anemia.

The red blood cells used were actually a waste product, as large quantities are usually discarded in the preparation of plasma for use in treatment of shock.

Three Navy doctors report (*Journal, American Medical Association,* Aug. 14) that half the patients requiring blood transfusions in a large hospital need only the red blood cells. This dovetails beautifully with plasma production for the armed forces.

There were only two cases in the 116 uses of red blood cells that caused any difficulties, and only a few cases (4 out of 72 carefully studied) failed to show improvement.

The Naval surgeons who conducted the tests were Lieut. Clifford K. Murray, Lieut. Comdr. Donald E. Hale, and Capt. C. M. Shaar.

Science News Letter, August 21, 1943

NUTRITION

Invalid Food Package Now Reaching Prisoners

➤ NEW RED CROSS invalid food packages and medicine kits are now reaching American fighters who are prisoners of war.

The invalid package, which replaces the standard food package, is designed to give prisoners who are sick or wounded better nutrition. One 11-pound package will be supplied weekly to each prisoner in poor health.

It contains ascorbic acid to supply vitamin C, lump sugar, dehydrated soup, coffee, chocolate, liver paste, biscuits, pork loaf, orange concentrate, prunes, Army spread made of butter and cheese, whole powdered milk, processed cheese, bouillon powder, ham and eggs, soap and cigarettes.

Since the prisoners are fed by the enemy, the kit is designed to supply mainly the food elements that are likely to be lacking.

The medicine kit is designed to supply the needs of 100 prisoners for a month. Each barracks leader, a representative of the prisoners, is responsible under medical supervision for the use of the medicines by the prisoners.

It contains supplies for bandaging and dressing injuries, aspirin, sodium bicarbonate, cathartic pills, germicide, tweezers, and a variety of ointments for such things as burns, eye infections, itch, lice, and fungus infections.

A stock of these medicine kits will be kept in Switzerland and sent to camps at the request of camp leaders or International Red Cross Committee delegates who visit the camps.

Science News Letter, August 21, 1943

PUBLIC HEALTH

Routine X-Ray Exams Spot Unsuspected TB

➤ IF EVERYONE admitted to a hospital were given a routine X-ray or fluoroscopic chest examination, about 4% of the patients would be found to have evidence of unsuspected tuberculosis infection, if findings of a two-year demonstration at Grasslands Hospital, Westchester County, N. Y., are typical.

Six out of each thousand examinations showed active disease requiring hospitalization or close observation in the study reported by Drs. William G. Childress, A. G. Debbie, and E. L. Harmon of Valhalla, N. Y. (*Journal, American Medical Association,* Aug. 14)

"This group is particularly important from a public health point of view because of the ease of transmitting the disease to others," the doctors state. By discovering previously unrecognized tuberculosis in the patients, better protection for the hospital worker is made possible through isolation and treatment of infectious cases."

In spite of the war shortages, most of the program at Grasslands is being continued and the physicians reporting suggested the inauguration of such programs at hospitals generally.

Science News Letter, August 21, 1943

PALEOBOTANY

NATURE RAMBLINGS

by Frank Thone

What Horse-Ancestors Ate

▶ LITTLE EOHIPPUS and his increasingly larger successors have trotted familiarly through many volumes, both heavily learned and lightly popular, for many years. Thanks to the abundant skeletal remains they left behind, in the rocks underlying our Great Plains, we know them all from hooves to teeth. We have even been able to infer from the teeth that the earliest horse-ancestors were browsers on rather generalized vegetation in the woods or on the forest-edges, but that the later forms became more and more specialized as grass-eaters.

But we did not know the grasses they ate. Bones and teeth, being solid and hard, fossilized well; "the grass which perisheth" left hardly a stem or leaf imprint in the muds of long ago on which we could base more than a plausible guess.

Now, however, we have the encouraging beginnings of a paleoflora of the Plains country during the last half of the Age of Mammals, thanks to Dr. Maxim K. Elias of the University of Nebraska and the Nebraska Geological Survey. He introduced his new science of paleoagrostology at the Dallas meeting of the American Association for the Advancement of Science (see SNL, Jan. 3, 1942, p. 7), and now produces his first book, *Tertiary Prairie Grasses and Other Herbs From the High Plains,* published by the Geological Society of America ($1.50).

Although stems and leaves of almost all grasses are so perishable that they almost never survive long enough to form any kind of fossils, the seeds and their most closely associated structures, lemma and palea, are often of almost bony hardness; and the new science of paleoagrostology is based almost entirely on tiny fossils of these parts, painstakingly sifted out of the rock dust of excavations at dozens of sites all the way from South Dakota to the Texas panhandle. By great good fortune, it is on the characters of exactly these structures that botanists base their classifications of grasses. It is not often that the obliterating forces of nature are so nicely considerate of a struggling scientist's needs.

Dr. Elias has been able to set up some half-dozen genera, all similar to, or even identical with, existing grasses. One of them, which he has named *Stipidium,* has 21 species and forms; another, *Berrichloa,* has seven. Among the seeds are also those of a few herbs other than grasses, like some of the borages, as well as the stony fruits of the hackberry tree. Evidently the prairies of ten and twenty million years ago already had a rather familiar look about them.

Science News Letter, August 21, 1943

ENTOMOLOGY

Fight Against Insects Intensified By the War

➤ THE FIGHT against insects has been intensified because of the war, Dr. Fred C. Bishopp, assistant chief of the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture, explained in Science Service's Adventures in Science program over the Columbia Broadcasting System.

Insects are among the most serious problems with which an army has to deal. Much attention is being given to keeping our soldiers free from loathsome pests with splendid results, Dr. Bishopp pointed out. Special precautions have been taken to protect them against lice, the little pests which are said to have stopped Napoleon's invasion of Russia by carrying the deadly epidemic typhus. Probably the most serious disease problem in our military operations is the mosquito-borne malaria, against which a number of methods of protection are being used.

Defense workers at home must also be saved from the annoyance and disease carried by insects, Dr. Bishopp related. Gardens, crops, stored grains, livestock, clothing and supplies likewise need to be protected.

"The insects have a whole bag of tricks and we entomologists now know many of them and are therefore less likely to be taken by surprise," Dr. Bishopp remarked. But it is hard, he explained, to convince people of the constant insect menace. They fail to back those attempting to exclude dangerous foreign pests, to strike early and effectively to prevent the spread and destructive foraging of insect hordes.

The war is making the problem of the entomologist increasingly difficult. By taking the Malay peninsula, the enemy has gotten control of the supply of one of our most dependable poisons for insects. Likewise a difficulty is presented by Kenya Colony in Africa having been the chief source of pyrethrum, used in making household sprays and against many food crop pests.

Experiments are being conducted, Dr. Bishopp said, to develop better methods of application and materials to make the scarce insect poisons go further. A search is being conducted for substitutes, and chemists are busy making hundreds of new compounds for the entomologists to try their effectiveness in insect control.

Science News Letter, August 21, 1943

Wasps in the home may be destroyed by placing a mixture of Paris green and honey where they will find it easily.

Both Brazil and Venezuela are producing *industrial diamonds* for American war purposes; they are used for drills, and for cutting, grinding and polishing high grade steel alloys.

Beeswax is needed by the Army and Navy; a national beeswax salvage program is now under way which government experts hope will round up a million pounds, the amount needed during one year.

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MEDICINE

New Battle Belt

Devised by a Canadian Navy medical officer, new belt makes it possible to have the necessary tools and drugs always available even in the dark.

➤ TREATMENT of Navy men wounded at their stations is simplified by a battle belt to be worn by medical officers, designed by Surgeon Lt. Comdr. C. M. Oake of the Royal Canadian Navy, the *Canadian Medical Association Journal* (August) reports.

During the darkness and confusion that go with naval action, Lt. Comdr. Oake points out, certain essentials for treatment are easily lost or difficult to extricate from an ordinary medical haversack when they should be available instantly for treatment of dangerous casualties.

A panel holder of plasticized material is worn around the chest or waist to hold a few necessary instruments and medicines that the medical officers may want to produce instantly.

The five pockets of the battle belt contain syrettes, small disposable tubes for administering morphine; wound labels and skin pencil for marking the kind and time of treatment; scissors and a long, narrow surgical knife, called a bistoury; a vial of morphine; and an emergency kit for treatment of eye injuries.

Clamped to the outside of the belt are hemostats for controlling hemorrhage, a length of rubber tubing, four cartridges of sulfathiazole crystals, and a flashlight with an adjustable beam.

Approved by the Medical Director-General, the unit is now being redesigned and will become available for issue to all Canadian ships which have medical officers.

Science News Letter, August 21, 1943

RESOURCES

Mediterranean Fishing Could Feed Impoverished

➤ SARDINIA'S SARDINES, for the past two decades or so, have been consumed mostly in Italy. Small quantities were still being imported into America before the war to satisfy the taste of Italian-Americans who have a particular liking for this especially cured and packed-in-olive-oil little fish. The commercial sardines used in America come from the Atlantic and Pacific coasts, and are packed principally in Maine and California. Some have been imported from Norway, France and Portugal.

During the past year or so, fishing in the Mediterranean has practically ceased, it is reported. Sicily and other Mediterranean islands and countries caught, packed and shipped much tunny, or tuna, in pre-war days. The Tunisia campaign brought this activity to a standstill.

Other fish is more or less plentiful in the Mediterranean. With the collapse of Italy's war resistance, the industry may start again. Much food to feed former Fascist followers could be obtained from this great body of water.

Except for local consumption, commercial fishing was never a great industry in the Mediterranean. Pre-war Italy, including Sardinia, Sicily and a number of the smaller islands, landed about 50,000 to 60,000 tons a year. Northern African fishermen together slightly exceeded Italy's catch. Eastern Mediterranean Asiatic countries caught a few thousand tons. Data for Greece and other European nations are not available, but their catches were small and used only locally.

France and Spain carry heavy fishing activities. Together they landed nearly $88,000,000 worth of sea products a year, but only a small part of this was from Mediterranean waters. These figures do not add up to big business as do fishing figures in America.

There are possibilities, however. With the food shortage in all the Mediterranean countries that have been occupied by the Nazis, the fishing industry could be expanded far beyond its past extent. Modern methods would have to be introduced. The industry could well be assisted by the United Nations in order to save long hauls of other foods to relieve the underfed Mediterranean people.

Science News Letter, August 21, 1943

United States and Brazilian business organizations are cooperating by sharing machine designs and manufacturing processes, thus recognizing the importance of *standards* in industrial developments.

Literally thousands of tons of *magnesium* are being mined from sea water at a location along the Texas Gulf Coast which three years ago was a dismal swamp.

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New Machines And Gadgets

HOMEMADE air raid whistles that bellow in competition with the commercial models can be welded from odds and ends of pipes and pipe fittings. Hoping to relieve jammed production facilities for air raid equipment and save money for small communities or industrial plants, the inventor has offered his design to anyone interested.

Science News Letter, August 21, 1943

TELEPHONE merry-go-rounds serve the double purpose of clearing cluttered desks and conserving needed communications instruments. Each turntable contains an inter-plant and an outside phone and rotates to service four desks, replacing eight phones at the usual two-per-desk allotment.

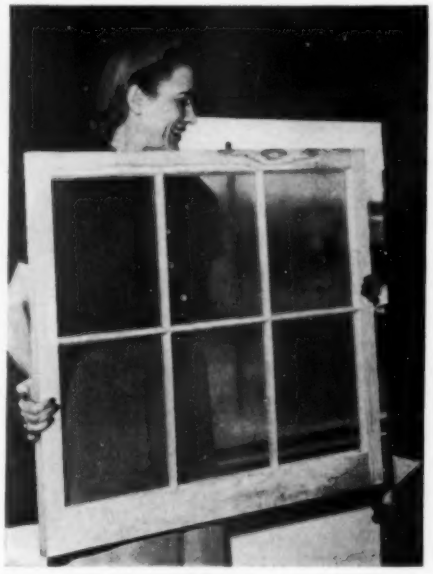
Science News Letter, August 21, 1943

INSOLES for the Army's jungle boots are made of five layers of plastic screening. They permit more ventilation between the foot and the rubber sole, and are easily cleaned. Field tests show that a sharp reduction of fungus foot diseases may be expected through use of the new insoles.

Science News Letter, August 21, 1943

WIRE SCREEN sandwiched between sheets of transparent plastic is put in frames to make office doors and partitions that bombs can never shatter, as shown in the picture. Originally designed as a safety measure, the light-weight material is now tagged for post-war use as movable partitions. Offices could thus be shifted in size and arrangement to fit business needs.

Science News Letter, August 21, 1943



A SELF-LIGHTING cigaret which ignites when scratched on a striking surface, recently patented, is an improvement over previous self-lighters. It is claimed that the striking tip will not fly off, does not lengthen the cigaret, and creates no noxious odors.

Science News Letter, August 21, 1943

"GRASSHOPPER" PLANES used by the Army for observation are extremely maneuverable and can operate from small fields and dirt roads. Low landing speed increases their agility. Plastic cockpits give the pilot and observer a wide range of vision. Many of the planes have two-way radio equipment.

Science News Letter, August 21, 1943

SPEED SYNCHRONIZERS enable pilots of multi-engined war and cargo planes to synchronize automatically all engines at the most efficient engine speed simply by adjusting a single control knob. This device promises to replace the present control system which requires the pilot to manipulate a separate lever for each engine.

Science News Letter, August 21, 1943

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 170.*

PHYSIOLOGY

Old Eyes Must Be Geared To Do Work in War Plant

➤ WHEN mother takes Junior to the eye doctor to have his eyesight checked before he enters school, it might be a good idea to take grandpa and grandma along. Junior may be nearsighted or have astigmatism and need proper glasses so that he will be able to use his eyes without strain and to learn his lessons without the handicap of poor eyesight. Grandma and grandpa may before long be working in a war plant, if they are not already, and their older eyes will probably need special glasses to gear them to certain kinds of industrial work.

Any time after the age of 40 men and women are likely to find it increasingly hard to read the newspaper or the telephone directory or to thread needles. The medical name for this condition is presbyopia. It is due to loss of elasticity of the eye lens as a result of which the lens can no longer be focused for near vision. Then it becomes necessary to wear eye glasses in order to see clearly at close range, as in reading and sewing. But the eyeglasses that enable grandpa and grandma to read the newspaper and darn Junior's socks may not give them the clear eyesight they need for reading the fine divisions on a micrometer gauge or inspecting the stitching on a parachute or gas mask cover. Even if the reading glasses are adjusted for the difference in working distance from ordinary reading or sewing distance, there may be other eyesight difficulties which would not be noticed in ordinary home life.

Older eyes gradually lose acuity of vision as well as ability to focus on near objects. Dark adaptation slows down and there is difficulty in color appreciation. Grandma knows whether her dress is read or blue but she might have trouble, for example, matching colors in material for camouflage unless some correction in her color appreciation could be made.

The need for paying attention to these seeing problems of old eyes, now that the "young eyes of our nation's men are at work in the bombardier's bay, at watch on the bridge of a destroyer, on guard on the desert," is stressed in a report from the *American Academy of Ophthalmology and Otolaryngology.*

Science News Letter, August 21, 1943

The new Brazilian *steel plant* at Volta Redonda will be able next year to produce all the steel needed for Brazilian armament and shipping.

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First Glances at New Books

➤ RADIO miracles that have sprung from the first stuttering message broadcast the length of a room are largely due to the vision of one man. His life story is recounted by Douglas Coe in the book, MARCONI (*Julian Messner,* $2.50). Other scientists are included who influenced Marconi and helped spin the thread of wireless history.

Science News Letter, August 21, 1943

➤ ANGEL, it seems, can be a family name. ANGEL OF THE NAVY (*Hastings House,* $2) relates the experiences of the author, Joan Angel, as a WAVE, from enlistment to assignment to active duty. A good deal of helpful information about the WAVES is to be found in this most amusing book.

Science News Letter, August 21, 1943

➤ FASCINATING, as meeting-points of ethnology, art and religion are the ecclesiastical statues and paintings wrought by the untaught Mexican folk, including those within our own boundaries. The naive artists make up for lack of technical skill by intensity of feeling. In preparing the group of annotated photographs that constitute SANTOS: THE RELIGIOUS FOLK ART OF NEW MEXICO (*Taylor Museum,* Colorado Springs, Colorado, $4), Mitchell A. Wilder and Edgar Breitenbach have set up a monument that will be of interest alike to ethnologists and students of art.

Science News Letter, August 21, 1943

➤ RABBIT RAISING, once a minor agricultural pursuit, has become a major project in our national food production program. HOW TO RAISE RABBITS FOR FOOD AND FUR by Frank G. Ashbrook, in Charge, Fur Resources, Fish and Wildlife Service of the U. S. Department of the Interior, will prove invaluable to amateurs planning to raise a few rabbits in their backyard as well as to those undertaking rabbit-raising on a large scale. The recipes for stewed rabbit, rabbit pie, and rabbit a la Marengo will make your mouth water. (*Orange Judd,* $2).

Science News Letter, August 21, 1943

➤ FLOWERS through the whole horticultural alphabet, from Abronia to Zygopetalum, are described and most appropriate uses suggested, in the first part of Albert E. Wilkinson's FLOWER ENCYCLOPEDIA AND GARDENER'S GUIDE, and in the last section cultivation directions are given. It is a good, compact, one-volume compendium of flower gardening, and at an astonishingly low price. (*New Home Library, Garden City Pub. Co.,* 69c).

Science News Letter, August 21, 1943

➤ EVERYTHING about plastics, well presented, has been the aim of Herbert R. Simonds, Carleton Ellis and Capt. M. H. Bigelow in compiling a HANDBOOK OF PLASTICS (*Van Nostrand,* $10). With the cooperation of key men in the industry, they have succeeded remarkably well in comprehensively putting in one volume the physical and chemical properties of plastics, their production, manufacture and finishing. Glossaries, bibliography, detailed index and many tables have been included to make the book more usable.

Science News Letter, August 21, 1943

➤ FOUR HUNDRED YEARS of exploration, settlement and cultural development of the entire Western Hemisphere is interestingly covered in THE STORY OF THE AMERICAS, a new 700 page book, by Leland D. Baldwin (*Simon and Schuster,* $3.50). This is in narrative form with many bits of humor.

Science News Letter, August 21, 1943

➤ SCIENTISTS AND LAYMEN will enjoy the story of scientific discoveries and their application to modern life as told in MAN AND HIS PHYSICAL UNIVERSE, by F. C. Jean, E. C. Harrah, F. L. Herman and S. R. Powers (*Ginn,* $3.25). The book is especially for those who do not intend to specialize in the field of science but who desire general knowledge in many sciences to enable them to understand properly their relations to the universe and fellowmen.

Science News Letter, August 21, 1943

• Just Off the Press •

BELGIAN HUMOR UNDER THE GERMAN HEEL—*The Belgian Information Center,* 630 Fifth Ave., New York City. A pamphlet of cartoons from the Belgian underground, distributed by the Belgian Information Center.

THE CHEMICAL BACKGROUND FOR ENGINE RESEARCH—R. E. Burk and Oliver Grummitt—*Interscience Publishers,* 297 p., illus., $3.50. Vol. II of Frontiers in Chemistry, published under the auspices of Western Reserve Univ. A series of lectures by experts on combustion processes and lubrication.

DISEASES AND PESTS OF ORNAMENTAL PLANTS—Bernard O. Dodge and Harold W. Rickett—*Jaques Cattell Press,* 638 p., illus., $6.50.

FATS AND OILS IN THE WAR—Karl Brandt —*Stanford Univ.,* 60 p., tables, 25c.

HOME CANNING IN WARTIME: A Victory Guide to Canning, Preserving, Pickling, and Drying—Elsie Clarke — *World Pub. Co.,* 123 p., illus., 49c.

ISLANDS AND PEOPLES OF THE INDIES—Raymond Kennedy—*Smithsonian Institution,* 66 p., illus. Free upon direct application to Smithsonian. War background studies No. 14.

1000 PRE-FLIGHT PROBLEMS — W. H. Thompson and M. L. Aiken—*Harper,* 160 p., 88c, paper. (Cloth-bound $1.20 as of September 1, 1943)

PENICILLIN: Annotated Bibliography (No. 1-81) With Detailed Subject Index—*Winthrop Chemical Co.,* 170 Varick Street, New York 13, N. Y. Single copies available to interested scientists on request. The first annotated bibliography on penicillin containing abstracts of 81 papers published since 1929.

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